EXPERIENCE IN THAWING FROZEN WATER SERVICES, HYDRANT BRANCHES AND HYDRANTS AT SYRACUSE, NEW YORK[1]

By Charles A. Windholz

For thawing services, the water department built in 1914, a portable, gasoline-electric, low-voltage, generating outfit. This consists of a four-cylinder, $4\frac{3}{8}$ by 6-inch automobile-type engine, directly connected by a flexible coupling to a 15-kilowatt direct-current generator. The generator is the type used in electric welding and cutting and will operate satisfactorily on any voltage from 10 to 50. It is an interpole, shunt-wound machine. The speed is kept at 1200 r. p. m. by means of a centrifugal governor. Between the engine and generator is mounted a varnished 2-inch oak switchboard on which is placed the main cut-out switch, rheostat, voltmeter, ammeter, and engine controls. Two large wooden reels each containing 250 feet of extra-flexible, rubber-covered, 300,000 c.m. cables are placed at the rear of the machine. The engine and generator, together with radiator, switchboard and reels, are mounted on two 10-inch channels. When desired for service, this unit is placed either on a sled or truck, according to the conditions of the weather, and is easily drawn by one team.

Three men usually accompany this outfit when in service, the man in charge of the machine, the driver and a helper. When the premises to be thawed are reached, enough of the cable is unwound from the reel to reach inside the premises, where it is connected to the service near the stop-and-waste cock. The other cable is connected to a nearby hydrant. Connection is then made between the generator terminals and the cables by inserting a plug on the end of the terminal in the socket to which the inner end of the cable is connected.

The practice in this department is to disconnect the water meter from the service, as it is found that often the current is divided, part going through the service and part through the plumbing in the house and thence back to the hydrant through the lighting company's neutral wire, gas pipes and in other ways.

[1] Read before the annual convention at St. Louis, May 16, 1918.

When properly connected, the engine is started and after attaining full speed, the rheostat is operated until the volt-meter reads approximately 20 volts, when the line switch is closed. As the load comes on, the voltage is increased until the ammeter reads about 500 amperes. The voltage required to maintain this current varies from 20 to 50 volts, according to the length and resistance of the service.

The time required to thaw a service varies from two to fifteen minutes; as a rule, only five minutes is required to start the water running. The small services in Syracuse are all of AAA lead. The department has had no experience in thawing iron services. The time required to make ready, thaw a service, wind up the cable, and get ready to move on is approximately fifteen to twenty minutes, and one outfit can thaw fifteen or more services in a day if they are located not too far apart.

The total weight of the unit is 3500 pounds and its cost was approximately $1500. Although it was built in 1914, on account of the light winters of 1914 and 1915, it was not taken out of storage except for test. In the winter of 1916–1917 about thirty services were thawed. During the past winter (1917–1918), 298 services, three hydrant branches and one 8-inch main were thawed with this outfit. The total cost of labor, teams, fuel and repairs amounted to $921.24, or approximately $3 per service thawed.

Due to the intense cold of the past winter, the ground was frozen to a depth of 4 and 4½ feet. Such a large number of services were frozen that it was impossible to take care of them with this one unit and it was necessary to use three 220–110 volt transformer units to assist in this service. This method of thawing is very satisfactory, but is slower and more expensive than the gasoline-generating unit. For this service, the Lighting Company was paid $1438.03 and the cost of trucks, teams and labor was $417.83, making a total cost of $1855.81, or a cost per service of approximately $8.50. Two 8-inch mains and several hydrant branches and 207 services were thawed with transformer outfits.

During the winter considerable trouble was experienced with hydrants freezing that had not properly drained. For thawing these, a small upright boiler mounted on a light sled was found most convenient. By inserting a steam hose in the nozzle of the hydrant, the ice is quickly thawed and the hydrant placed in operating condition.